REVIEWS

Principes de Statistique Theorique et Appliquée. By Armand Julin. Paris: Albert Dewit. 1921. xxiii, 712 pp.

This work on statistical method is more complete than any similar treatise in English. It begins with a review of the development of the science and then proceeds with the discussion of the principles involved in the usages of present day statisticians. Little effort is made by M. Julin to develop new methods, but he not only attempts but succeeds most admirably in explaining the philosophy underlying the principal processes utilized by statisticians. He compares and criticizes the methods that they follow, and makes clear his reasons for selecting those modes of procedure which he believes to be best adapted to specific classes of problems. In this criticism he shows marked familiarity with the writings of both English and American statisticians.

The book is so voluminous that it seems better adapted for service as a general reference work or as a guide for advanced students than as a text for beginners.

Most of the formulae developed are elementary in nature, hence the non-mathematical student of statistics can understand the majority of them without difficulty.

In general, the author follows the customary terminology, but in a few instances he introduces innovations. For example, he uses the term *covariation* instead of *correlation* to signify any similarity in the fluctuations of two variables. He advocates this procedure because it makes no assumption that the two variables are in any way dependent upon each other, an implication which many statisticians believe to be inherent in the word *correlation*. Despite the admirable desire for accuracy evinced in this respect, it seems to the reviewer that M. Julin has failed to distinguish clearly between the two related but entirely dissimilar ideas represented respectively by the coefficient of correlation and the ratio of variation. It must be said, however, that in failing to emphasize this distinction he is by no means alone.

Although oversights occasionally occur, they are so rare that they stand out as contrasts to the accuracy characterizing the work as a whole. The reasoning is lucid and logical and the style is both simple and pleasing.

This book is decidedly more complete than most similar studies and compares favorably in clarity and definiteness with any of the previously existing works on statistics that have come to the attention of the reviewer.

WILLFORD I. KING

Enquiry into Production. International Labour Office. London: Harrison & Sons. 1920. 188 pp.

This Introductory Memorandum is a remarkable publication. Unfortunately, its extraordinary qualities lie in its defects. It is inadequate, unintelligent, un-

discriminating, at points even slovenly. Its general deficiency can only be appreciated from first-hand acquaintance; a brief review cannot hope to convey a clear impression of the publication's offences. But some account of the Memorandum seems desirable, especially since its appearance raises serious questions concerning the future work of the International Labour Office.

The Memorandum opens with a report of the discussion which led the Office to undertake the *Enquiry into Production*. Apparently the investigation had its origin in a consideration of the effects of the eight-hour day upon the volume of production. Discussion of this specific issue gradually widened to include all factors contributing to the "crisis of underproduction." Finally, at its Genoa meeting in June, 1920, the Governing Board of the Office ordered "an enquiry into industrial production throughout the world, considered in relation to conditions of labour and the cost of living."

Acting in pursuance of the Board's resolution, the Office conceived its commission to be: "(1) to ascertain the actual facts as regards production and prices; (2) to determine the essential factors which explain the facts; (3) to indicate the solutions which appear to be suggested both by theoretical enquiries and by the facts themselves." No factor relating to underproduction was to be neglected. The task in these dimensions would have seemed Utopian to those in charge had it not been possible to use the results of numerous investigations along similar lines. In the opinion of the Labour Office the task was simply to assemble this information and to supplement it as might be necessary by independent original enquiry.

The Introductory Memorandum is designed to acquaint the public with the general character of the enquiry—"to bring out the spirit of the work and to indicate its main lines and their justification." The extent to which the Memorandum effects this purpose will appear upon a closer examination of the character of the publication.

The Memorandum is really in three sections: a text constituting slightly more than one-half the issue; a schematic plan of enquiry with questionnaires, covering fifteen pages; and a series of fifteen appendices reproducing various documents which, presumably, the Office has found useful in pursuit of the enquiry.

The appendices may be dismissed with a word. They vary widely in length and character. The first is a single-page account of the establishment of the British Government Committee on Increased Production in Industry; the second, a reprint of the questionnaire issued by this Committee. In other appendices questionnaires employed by other investigating bodies are reproduced in full. Appendix XIII reprints the Economic Declaration of the Supreme Council as approved on March 8, 1920; Appendix XII, a report submitted to the Fourth Inter-Allied Commission for Assisting the Disabled in the War, giving statistics relating to the effect of war accidents on the state of employment. Some of these reports furnish valuable material, relevant to an enquiry into production. Others are of doubtful applicability. In general, the wisdom of their inclusion in this Introductory Memorandum may be seriously questioned. It would have been much better to defer their publication until the progress of the Enquiry demonstrated their importance to the ultimate findings.

The text of the Memorandum appears in three parts: Part I: The Facts—the phenomena of physical production; Part II: Explanation of the Facts—the causes of underproduction; Part III: A Critical Study of the Solutions—the means of restoring normal production.

The "facts," submitted in Part I, relate to aggregate amount of production, production per worker, variations in demand, and changes in prices. The only statistics of production actually presented are: (1) those on coal, pig iron, and crude steel, published in the *Monthly Bulletin of Statistics* of the Supreme Economic Council; (2) and the familiar figures on shipbuilding issued quarterly by Lloyds. These are given in detail, in both table and chart form. On the subject of production per worker, the Memorandum reprints data from the report of the United States Bureau of Mines on the daily and annual coal production per man employed underground in numerous important coal-producing countries from 1901 to 1918. No data are submitted on variations in demand. Retail prices of food are shown by reproducing the material presented to the Brussels International Financial Conference by Professor A. L. Bowley.

Inadequate as this collection of material is, it is less unsatisfactory than the data brought together in Parts II and III on "causes," and "solutions." Among the causes cited are: the crisis in raw materials; the transport crisis; the shortage of plant; the exchange crisis; credit problems; numerous factors connected with labor; and psychological and moral factors. The solutions considered relate to: the democratization of industry; the question of piece-work rates; the specialization of labor; the improvement of apparatus; rates of exchange and raw materials. In general, the material on these subjects consists of statements taken from miscellaneous sources, with no attempt at evaluation or interpretation. No better characterization of the presentation can be given than the following quotation: "Whatever may be the qualifications of the author from whom we have borrowed these figures, we reproduce them here without expressing any personal judgment in regard to them."

The outline Plan of Enquiry and Questionnaires, constituting the second section of the Memorandum, is its least objectionable feature. True, the questionnaires are of such a nature as to solicit opinions rather than concrete data, and are in parts so general as to promise no satisfactory results. But the circulation of questionnaires in provisional form has its advantages. And the publication of this part of the Memorandum could be readily understood if its purpose were to secure for the Office the benefit of outside criticism.

There is no specific evidence, however, that any part of the Memorandum has been prepared with this end in view. Upon the whole, the report seems intended to prove the willingness of the Office to include in its Enquiry any item of information however remotely connected with production. There is a consistent indisposition to separate the significant from the irrelevant, the valuable from the worthless, the authoritative from the casual. The recurring promises of what the Enquiry *will* do are not to be taken seriously until there is more evidence of the Office's capacity for judicious discrimination.

Altogether, the Introductory Memorandum is an amazing document. It is a strange conglomeration of material—opinions, tables, and charts, good, bad, and

indifferent. The body of the text is a mixture of plans which it is stated the enquiry will develop; of facts which are submitted in evidence in the study; and of inadequately supported statements drawn from every variety of source. The Memorandum as a whole is of a piece only in its extraordinary deficiencies—its careless composition, its superficial treatment of material, its unintelligent plan of procedure.

The events of the past year add a touch of irony to the entire issue. The crisis of underproduction has passed into a world-wide depression in which traders cannot dispose of goods on hand and manufacturers complain of accumulated stocks. An enquiry into production is needed as much as ever, but it should not be conducted along the lines nor in the spirit of the Labour Office's Introductory Memorandum. This ill-fated publication is an excellent example of what not to print. A fitting title would be: "Preliminary Office Notes—(Published by Mistake)."

EDMUND E. DAY

The Assessment of Physical Fitness. By Georges Dreyer, G.B.E., M.A., M.D. Cassell and Company, Limited: London, New York, Toronto, and Melbourne. 1920. 115 pp.

Dreyer commences his book with a statement that most of the existing tables dealing with the size of the normal human body are based on the theory that definite relations between age and height and weight exist. It has been satisfactorily proved that such relationships do not exist when individuals varying widely in size are examined. Dreyer's findings seem to indicate that definite relationships between weight of body and length of trunk (*i. e.*, the sitting height) and the circumference of the chest do exist, and that these have a definite relation to the vital capacity of the lungs.

He had previously determined these definite relations, not only between the weight and certain measurements of the body but also between these bodily measurements and the functional measurement of vital capacity, and presents his results with a hope that general application of these relationships might add greatly to our present knowledge regarding standards of health development, good physique, and physical fitness. After a careful examination of many thousand individuals, and an analysis of the results obtained, Dreyer is enabled to explain the relationship between weight and sitting height, weight and chest measurement, chest measurement and sitting height, vital capacity and weight, vital capacity and sitting height, and vital capacity and chest measurement, for both males and females, in the following formulae: *

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$$W = 0.38025\,\lambda^{\frac{1}{0.319}};\quad W = 0.662\,Ch.^{\frac{1}{0.365}};\quad Ch. = \frac{\lambda^{1.1442}}{2.00148};$$

* W = weight of the body in grammes; λ = length of the trunk in centimetres; $Ch.$ = circumference of the chest in centimetres; $V.\ C.$ = Vital Capacity in cubic centimetres. The constants for Vital Capacity represent Class A.